DI(2-ETHYLHEXYL) PHTHALATE CAS #117-81-7

This fact sheet answers the most frequently asked health questions (FAQs) about di(2-ethylhexyl) phthalate. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

SUMMARY: Exposure to di(2-ethylhexyl) phthalate or DEHP is generally very low. Increased exposures may come from intravenous fluids delivered through plastic tubing, and from ingesting contaminated foods or water. DEHP is not toxic at the low levels usually present. In animals, high levels of DEHP damaged the liver and kidney and affected the ability to reproduce. DEHP has been found in at least 587 of 1,300 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is DEHP or di(2-ethylhexyl) phthalate?

(Pronounced dī ĕthʹəl (2-hĕksʹ ĕthəl) thălʹ āt)

Di(2-ethylhexyl)phthalate is a manufactured chemical that makes plastic more flexible. It is also called DEHP. DEHP is a colorless liquid with almost no odor. DEHP is in polyvinyl chloride (PVC) plastic products like toys, vinyl upholstery, shower curtains, adhesives, and coatings. Vinyl plastic may contain up to 40% DEHP.

DEHP is also used in inks, pesticides, cosmetics, and vacuum pump oil. It is used to detect leaks in protective face gear, and as a test material for filtration systems. Trade names for DEHP are Platinol DOP®, Octoil®, Silicol 150®, Bisoflex 81®, and Eviplast 80®. Use of trade names is for identification only and does not imply endorsement by the Agency for Toxic Substances and Disease Registry, the Public Health Service, or the U.S. Department of Health and Human Services

What happens to DEHP when it enters the environment?

- ❑ DEHP is everywhere in the environment because of its use in plastics, but it evaporates into air and dissolves into water at very low rates.
- ❑ DEHP from plastic materials, coatings, and flooring can increase indoor air levels.
- ❑ It dissolves faster in water if gas, oil, or paint removers are present.
- ❑ It attaches strongly to soil particles.
- ❑ Small organisms in surface water or soil break it down into harmless compounds.
- ❑ It doesn't break down easily in deep soil, or in lake or river bottoms.
- ❑ It is in plants, fish, and other animals, but animals high on the food chain are able to breakdown DEHP, so tissue levels are usually low.

How might I be exposed to DEHP?

DEHP is usually present at very low levels even in the sources of potentially higher exposures listed below.

- ❑ Using medical products packaged in plastic such as blood products.
- ❑ Eating some foods packaged in plastics, especially fatty foods like milk products, fish and seafood, oils, but levels still usually quite low.
- ❑ Drinking well water near waste sites, but levels usually are low.

- Breathing workplace air or indoor air where DEHP is released, but usually not at levels of concern.
- Fluids from plastic intravenous tubing if used extensively as for kidney dialysis.

How can DEHP affect my health?

There is no evidence that DEHP causes serious health effects in humans. Most of what we know about the health effects of DEHP comes from high exposures to rats and mice. Adverse effects in animals were generally seen only at high doses or with long-term exposures. You are not likely to be exposed to these very high levels. Moreover, absorption and breakdown of DEHP in humans is different than in rats and mice, so the effects seen in rats and mice may not occur in humans. The studies in rats and mice with DEHP in the air produced no serious harmful effects. There was no effect on lifespan or the ability to reproduce.

Brief exposure to very high levels of DEHP in food or water damaged sperm, but the effect reversed when DEHP was removed from the diet. Longer exposures to high doses affected the ability of both males and females to reproduce and caused birth defects. High levels of DEHP damaged the livers of rats and mice. Long exposures of rats to DEHP caused kidney damage similar to the damage seen in the kidneys of long-term dialysis patients.

Whether or not DEHP contributes to human kidney damage, is unclear at present. You should have no health effects from skin contact with products containing DEHP because it cannot be taken up easily through the skin.

How likely is DEHP to cause cancer?

The Department of Health and Human Services (DHHS) has determined that DEHP may reasonably be anticipated to be a carcinogen. There is no evidence that DEHP causes cancer in humans, but high exposures in rats and mice increased liver cancer. Based on these studies, the Department of Health and Human Services (DHHS) has determined that DEHP may reasonably be anticipated to be a carcinogen.

Is there a medical test to show whether I've been exposed to DEHP?

A test is available that measures a breakdown product of DEHP called mono-2-ethylhexyl)phthalate (MEHP). MEHP is measured in your urine or blood. This test is good only for recent exposures because DEHP remains in your body for only a short time. These tests require special equipment that is not routinely available in a doctor's office.

Has the federal government made recommendations to protect human health?

The EPA proposed a limit of 6 parts DEHP per billion parts of drinking water (6 ppb). The Food and Drug Administration (FDA) limits the types of food packaging materials containing DEHP. The Occupational Safety and Health Administration (OSHA) and the American Conference of Governmental Industrial Hygienists (ACGIH) limits the average level of DEHP in workplace air to 5 milligrams per cubic meter (mg/m^3) over an 8-hour workday and 10 mg/m^3 for a 15-minute exposure.

Glossary

Carcinogen: Substance that can cause cancer.

CAS: Chemical Abstracts Service.

Ingesting: Taking food or drink into your body.

ppb: Parts per billion.

Milligram (mg): One thousandth of a gram.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1993. Toxicological profile for di(2-ethylhexyl) phthalate. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop E-29, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 404-639-6359. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.